

CLAIMS

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1. Method of reconfiguration for a network node in an ad-hoc network, comprising the steps:
 - 10 preparing a transition from an initial software configuration to a target software configuration;

deciding on commitment to the target software configuration in view of a result of reconfiguration indicated through at least one further network node
15 in the ad-hoc network.
2. Method according to claim 1, **characterized in that** it further comprises a step of negotiating a maximum
20 reconfiguration time period with at least one further network node before executing the transition from the initial software configuration to the target software configuration.
- 25 3. Method according to claim 2, **characterized in that** the maximum reconfiguration time period is the maximum time for reconfiguration, indication of reconfiguration result, and executing a fallback to the initial software configuration for network nodes
30 in the ad-hoc network participating in the reconfiguration process.

4. Method according to one of the claims 1 to 3,
characterized in that it further comprises a step of
coordinating a start of reconfiguration at the network
5 node with a start of reconfiguration in at least one
further network node.
5. Method according to one of the claims 2 to 4,
characterized in that it further comprises a step of
10 starting a timer in the network node for measurement
of actual reconfiguration time versus maximum
reconfiguration time period.
6. Method according to one of the claims 1 to 5,
15 **characterized in that** it further comprises a step of
determining network nodes being reachable from the
reconfigured network node when ad-hoc network
communication is interrupted during the transition
from the initial software configuration to the target
20 software configuration.
7. Method according to one of the claims 1 to 6,
characterized in that the step of committing to the
target software configuration is taken when every
25 result of reconfiguration received at the network node
from a reachable further network node is evaluated to
be positive.
8. Method according to one of the claims 1 to 6,
30 **characterized in that** it further comprises a step of
falling back to the initial software configuration

when at least one result of reconfiguration received at the network node from a reachable further network node is evaluated to be negative.

- 5 9. Method according to one of the claims 1 to 6,
 characterized in that it comprises a step of falling
 back to the initial software configuration when no
 result of reconfiguration result is received at the
 network node until expiry of the maximum
10 reconfiguration time period.
10. Method according to one of the claims 1 to 9,
 characterized in that it further comprises a step of
 sending a positive reconfiguration result when the
15 transition from the initial software configuration to
 the target software configuration is successful.
11. Method according to claim 10, **characterized in that**
 the positive reconfiguration result is sent as
20 positive signal or indicated through automatic set-up
 of network connectivity.
12. Method according to claim 10 or 11, **characterized in**
 that the positive reconfiguration result is sent
25 repeatedly.
13. Method according to one of the claims 1 to 9,
 characterized in that it further comprises a step of
 sending a negative reconfiguration result when the
30 transition from the initial software configuration to
 the target software configuration is not successful.

14. Method according to claim 13, **characterized in that** the negative reconfiguration result is sent as fallback signal.
- 5
15. Method according to claim 13 or 14, **characterized in that** the negative reconfiguration result is sent repeatedly.
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16. Method according to one of the claims 13 to 15, **characterized in that** it further comprises a step of forwarding results of reconfiguration received from further network nodes to the ad-hoc network.
- 15
17. Method according to one of the claims 1 to 16, **characterized in that** it further comprises a step of determining network nodes in the ad-hoc network executing reconfiguration.
- 20
18. Method according to claim 17, **characterized in that** the step of determining network nodes in the ad-hoc network executing reconfiguration is based on at least one criteria selected from a group comprising:
- 25
- communication capability of network node;
 - network connectivity;
 - profile data of network node;
 - movement pattern of network node;
 - hardware status of network node;

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 - priority of network node; and
 - group membership of network node.

19. Method according to claim 17 or 18, **characterized in that** the step of determining network nodes in the ad-hoc network executing reconfiguration is executed
5 before start of reconfiguration.
20. Method according to one of the claims 17 to 19,
characterized in that the step of determining network nodes in the ad-hoc network executing reconfiguration
10 is repeated during reconfiguration.
21. Method according to one of the claims 1 to 20,
characterized in that it further comprises a step of
retrieving software for executing the transition from
15 the initial software configuration to the target
software configuration locally from a portable
electronic device (IC/USIM).
22. Method according to one of the claims 1 to 21,
20 **characterized in that** it further comprises a step of
retrieving software for executing the transition from
the initial software configuration to the target
software configuration remotely via a mobile
communication environment.
25
23. Method according to claim 22, **characterized in that** it
further comprises a step of selecting the mobile
communication environment from a group comprising a
mobile communication network, wireless local area
30 network, personal area network, wireless infrared

communication network (IrDA), Bluetooth communication network.

24. Method according to claim 22, **characterized in that** it
5 further comprises a step of selecting the mobile communication network from a group comprising GSM, PDC, IMT 2000, PHS, IS-95.
25. Method according to one of the claims 21 to 24,
10 **characterized in that** it further comprises a step of pre-installing software for executing the transition from the initial software configuration to the target software configuration in the network node.
- 15 26. Method according to one of the claims 21 to 25, **characterized in that** it further comprises a step of selecting software for executing the transition from the initial software configuration to the target software configuration from a group comprising
20 application software, communication software, operating system software, firmware.
27. Method according to claim 26, **characterized in that** it
25 further comprises a step of retrieving software for executing the transition from the initial software configuration to the target software configuration in combination with related control parameters.
28. Method according to one of the claims 1 to 27,
30 **characterized in that** software for executing the transition from the initial software configuration to

the target software configuration is network node specific.

29. Method according to one of the claims 1 to 28,
5 characterized in that the network node is a mobile device or a stationary device.
30. Network node for operation in an ad-hoc network,
10 comprising:

a software reconfiguration unit adapted to prepare a transition from an initial software configuration to a target software configuration;

15 a reconfiguration commitment unit adapted to decide on commitment to the target software configuration in view of a result of reconfiguration indicated through at least one further network node in the ad-hoc network.
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31. Network node according to claim 30, **characterized in that** it further comprises a negotiating unit adapted to negotiate a maximum reconfiguration time period with the at least one further network node before
25 executing the transition from the initial software configuration to the target software configuration.
32. Network node according to claim 31, **characterized in that** the negotiation unit is adapted to negotiate the
30 maximum reconfiguration time period as the maximum time for reconfiguration, indication of

reconfiguration result, and executing a fallback to the initial software configuration for network nodes in the ad-hoc network participating in the reconfiguration process.

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33. Network node according to one of the claims 30 to 32, **characterized in that** it further comprises a reconfiguration coordination unit adapted to coordinate a start of reconfiguration at the network node with a start of reconfiguration in the at least one further network node.
34. Network node according to one of the claims 31 or 33, **characterized in that** it further comprises a timer unit adapted to measure an actual reconfiguration time versus the maximum reconfiguration time period.
35. Network node according to one of the claims 30 to 34, **characterized in that** it further comprises a connectivity unit adapted to determine network nodes being reachable from the reconfigured network node when ad-hoc network communication is interrupted during the transition from the initial software configuration to the target software configuration.
36. Network node according to one of the claims 30 to 34, **characterized in that** the reconfiguration commitment unit is adapted to commit to the target software configuration when every result of reconfiguration received at the network node from a reachable further network node is evaluated to be positive.

37. Network node according to one of the claims 30 to 34,
characterized in that the reconfiguration commitment
unit is adapted to decide on falling back to the
5 initial software configuration when at least one
result of reconfiguration received at the network node
from a reachable further network node is evaluated to
be negative.
- 10 38. Network node according to one of the claims 30 to 34,
characterized in that the reconfiguration commitment
unit is adapted to decide on falling back to the
initial software configuration when no result of
reconfiguration result is received at the network node
15 until expiry of the maximum reconfiguration time
period.
39. Network node according to one of the claims 30 to 38,
characterized in that it further comprises a
20 communication unit adapted to send a positive
reconfiguration result when the transition from the
initial software configuration to the target software
configuration is successful.
- 25 40. Network node according to claim 39, **characterized in**
that the communication unit is adapted to send the
positive reconfiguration result as positive signal or
adapted to indicate the positive reconfiguration
result through automatic set-up of network
30 connectivity.

41. Network node according to claim 39 or 40,
characterized in that the communication unit is
adapted to send the positive reconfiguration result
repeatedly.
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42. Network node according to one of the claims 30 to 38,
characterized in that it further comprises a
communication unit adapted to send a negative
reconfiguration result when the transition from the
10 initial software configuration to the target software
configuration is not successful.
43. Network node according to claim 42, **characterized in
that** communication unit is adapted to send the
15 negative reconfiguration result as fallback signal.
44. Network node according to claim 42 or 43,
characterized in that communication unit is adapted to
send the negative reconfiguration result repeatedly.
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45. Network node according to one of the claims 39 to 44,
characterized in that the communication unit is
further adapted to forward results of reconfiguration
received from further network nodes to the ad-hoc
25 network.
46. Network node according to one of the claims 30 to 45,
characterized in that it further comprises a
determination unit adapted to determine network nodes
30 in the ad-hoc network executing reconfiguration.

47. Network node according to claim 46, **characterized in that** the determination unit is adapted to determine network nodes in the ad-hoc network executing reconfiguration based on at least one criteria
5 selected from a group comprising:
- communication capability of network node;
 - network connectivity;
 - profile data of network node;
 - 10 - movement pattern of network node;
 - hardware status of network node;
 - priority of network node; and
 - group membership of network node.
- 15 48. Network node according to claim 46 or 47, **characterized in that** the determination unit is adapted to determine network nodes in the ad-hoc network executing reconfiguration before start of reconfiguration.
- 20 49. Network node according to one of the claims 46 to 48, **characterized in that** the determination unit is adapted to determine network nodes in the ad-hoc network executing reconfiguration repeatedly during
25 reconfiguration.
50. Network node according to one of the claims 30 to 49, **characterized in that** it further comprises a software retrieval unit adapted to retrieve software for
30 executing the transition from the initial software

configuration to the target software configuration
locally from a portable electronic device .

51. Network node according to one of the claims 30 to 50,
5 **characterized in that** the software retrieval unit is
further adapted to retrieve software for executing the
transition from the initial software configuration to
the target software configuration remotely via a
mobile communication environment.
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52. Network node according to claim 51, **characterized in
that** the software retrieval unit is adapted to select
the mobile communication environment from a group
comprising a mobile communication network, wireless
15 local area network, personal area network, wireless
infrared communication network (IrDA), Bluetooth
communication network.
53. Network node according to claim 52, **characterized in
20 that** the software retrieval unit is further adapted to
select the mobile communication network from a group
comprising GSM, PDC, IMT 2000, PHS, IS-95.
54. Network node according to one of the claims 49 to 53,
25 **characterized in that** it further comprises a software
storage unit adapted to store software for executing
the transition from the initial software configuration
to the target software configuration in the network
node, the software being selected from a group
30 comprising application software, communication
software, operating system software, firmware.

55. Network node according to claim 54, **characterized in that** the software storage unit is further adapted to store software for executing the transition from the initial software configuration to the target software configuration in combination with related control parameters.
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56. Network node according to one of the claims 30 to 55, **characterized in that** it is a mobile device or a stationary device.
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57. A computer program product directly loadable into the internal memory of a network node of an ad-hoc network, comprising software code portions for performing the steps of one of the claims 1 to 29, when the product is run on a processor of the network node.
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